THURSDAY, OCTOBER 21, 1880

SCIENTIFIC WORTHIES

XVI.—RICHARD OWEN

AMONG time-honoured sayings there is none the truth of which comes more frequently home to the scientific worker than that which reminds him that a prophet is not without honour save in his own country and among his own kin. Its very truth would seem to make it short of impossible for us to take full cognisance of our own Scientific Worthies. The subject of this notice, still in hale strength, though now in full years and full of honours, is however in a very great measure an exception to the above proverb. Foreign men of science and foreign countries when they came to offer him their rewards found him already decorated. That a life abounding in labour, some of the results of which will remain as the heritage of mankind, was not undeserving of human recompense the following lines will abundantly show.

Richard Owen was born on July 20, 1804. He matriculated in the University of Edinburgh in 1824. Entering Bartholomew's Hospital the following year, he took the diploma of the Royal College of Surgeons in 1826. In 1825 he visited Paris, making the acquaintance of Baron Cuvier. On the completion of his medical studies Mr. Owen settled down to practise in Serle Street, Lincoln's Inn Fields. While at Bartholomew's Hospital he had been one of Dr. Abernethy's dissectors, and in 1828, on Dr. Abernethy's suggestion, he was employed at the College of Surgeons to make the catalogue of the Hunterian Collection in that institution. Mr. Clift was the Conservator of the College Museum at this time. The first catalogue of the invertebrate animals in spirits was published by the College in 1830, and in the following year appeared the memoir on the Pearly Nautilus (*Nautilus pompilius*), with some excellent drawings from the author's pencil.

The Zoological Society of London had been at this time in existence for some years, but up to 1830 it can scarcely be said to have had any scientific life. Some few of the then Fellows determined it should be otherwise, and after some little opposition the Council of the Society allowed the formation of a committee of science, who were further permitted to publish their own *Proceedings*. The first meeting of this committee was held on November 9, 1830, at which Owen read a paper on the anatomy of the Orang-Utan. It is not without interest to note that at the next meeting, held December 28, 1830, a letter was read from Vaughan Thompson, mentioning his discovery of a metamorphosis in Crustacea. From 1830 to the present date the contributions to the *Transactions* and the *Proceedings* of the Zoological Society of Mr. Owen have been both numerous and important, and for many years he was the unpaid prosector to the Society. He also at this period read several papers on pathological subjects before the Medical Society of St. Bartholomew's and the Medical and Chirurgical Society of London, one of the most remarkable of which was that describing the anatomical results of the ligature of the internal iliac artery, by Dr. Stevens, at Santa Cruz in 1812.

In 1834 a Chair of Comparative Anatomy was founded for Mr. Owen at St. Bartholomew's Hospital. In the year 1835 he published an account of a remarkable nematoid worm found living in the muscles of the human body (*Trichina spiralis*), and giving rise to a serious and often fatal disease called trichinosis, since, unfortunately, too well known. In 1834 he was elected a Fellow of the Royal Society, and in the same year was appointed the first Hunterian Professor at the Royal College of Surgeons. This chair he continued to fill until 1855. Mr. Owen, on succeeding his father-in-law, Mr. Clift, as Conservator of the Museum of the College of Surgeons, gradually retired from professional practice, and after a short time devoted himself exclusively to scientific pursuits. Of the thirty years during which he worked at Lincoln's Inn Fields, the last twenty were mainly spent in the study of comparative anatomy. A very rapid survey of the immense amount of work accomplished by him during this period will not be without interest. The catalogue of the physiological specimens in the Hunterian Collection consists of five quarto volumes, which were published by the Council of the College of Surgeons between 1833 and 1840. The catalogue of osteological specimens is contained in two quarto volumes published in 1853, and that of the Fossil Vertebrates and Cephalopods in three quarto volumes published in 1855.

The great work on the study of teeth was issued between 1840–1845. In preparing the drawings for this work Prof. Owen was threatened with an attack of retinitis, and was compelled to commit the further preparation of the illustrations to the excellent artists Lens Aldous and Erxleben.

The well-known Lectures on Comparative Anatomy and Physiology appeared between 1843 and 1846. After a one-and-twenty years' study of the homologies of the vertebrate skeleton, Prof. Owen's era-marking work on the "Archetype and Homologies of the Vertebrate Skeleton" was published. After having made a certain progress in comparative anatomy the evidences of a greater conformity to type, especially in the bones of the head of the vertebrate animals, than the immortal Cuvier had been willing to admit, began to enforce on Prof. Owen a re-consideration of Cuvier's conclusions to which for long he had yielded implicit assent. The results of these reconsiderations were successively communicated to the Royal College of Surgeons of England in the Course of Hunterian Lectures for 1844–45, and a sketch of his general views on the subject was laid before the British Association at Southampton in 1846. In 1849 were published the memoirs "On the Nature of Limbs," and "On Parthenogenesis." The term "parthenogenesis" was devised to replace a phrase somewhat cumbrous and incorrect, which was to this time applied to designate a phenomenon as interesting as strange.

Nor was all this sufficient for the superabundant energy of the Hunterian professor. The Palæontological Society succeeded in enlisting his services for a series of monographs of British fossil vertebrates, and during this period were published a memoir on the "Fossil Chelonian Reptiles of the Purbeck Limestones and Wealden Clays" (1853), the various supplements to which date from 1859 to 1879; "On the Fossil Reptiles of the London Clay" (1849, 1850), the portion of this memoir relating to the Chelonia was in part written by the late Prof. Bell; "On

the Fossil Reptiles of the Cretaceous Formations" (1851). A remarkable series of papers on the Fossil Birds of New Zealand and on some Fossil Mammals of Australia also about this date appeared in the *Transactions* of the Zoological Society, and a very elaborate memoir on the great American Megatherium in the *Philosophical Transactions*.

But even amid a scientific activity that rivalled that of his great friend Baron Cuvier, Prof. Owen had the energy to devote some time during these thirty years to the more direct benefit of his fellow men. He was appointed one of the Commissioners to inquire into the Health of Towns. This Commission sat during 1843 and 1846. A special report from his pen on the sanitary state of his native town, Lancaster, appeared in 1848, and the improved sewage of that town with a new water supply on the unintermittent system followed. He was appointed as one of the Commissioners on the Health of the Metropolis, 1846, 1848, and again on the Commission on the Meat Supply in 1849; as the result of this latter Commission it will be remembered that the famous market at Smithfield was suppressed, and the large Cattle Market was transferred to Islington.

Prof. Owen was also one of the Commissioners for the Great Exhibition of 1851; Chairman of the Jury on Raw Animal Products applied to Food and Manufactures, and Vice-Chairman of the Jury for "Les Substances Alimentaires" in the Great Exhibition of Paris in 1855. Labours so abundant were not without reward. In 1842 the Royal Society conferred on him the Royal Medal for his memoirs on the General Economy of the Monotremes and Marsupials. In 1846 the same society decreed to him the Copley Medal. In 1851 the King of Prussia sent to him the "Ordre pour le Mérite." In 1852 her Most Gracious Majesty assigned to him a residence in Richmond Park, and in 1855 the Emperor of the French bestowed on him the cross of the "Légion d'Honneur." The old Universities of Oxford, Cambridge, and Dublin conferred on him honorary degrees. The Royal College of Surgeons of Ireland made him an Honorary Fellow, and most of the learned societies of Europe and America numbered his name on their lists of Honorary or Corresponding Members.

John Hunter had left behind him a very abiding monument of his labours, some idea of which could now be obtained from the patient labours of the first Hunterian professor; but on terminating those labours Prof. Owen bethought him of yet another way in which he could make known the thoughts and works of the founder of philosophical surgery, which was, by the publication of Hunter's original papers. Between 1793 and 1800 Mr. Clift, F.R.S., had sole charge of the Hunterian collection and manuscripts, and during this period he had copied some proportion of the latter before they were removed from the Museum in Castle Street, Leicester Square, by the executor, Sir Everard Home. A short time previous to Mr. Clift's death he placed in Prof. Owen's hands the whole of his transcripts of the Hunterian manuscripts, with an autograph statement of the important fact. These were published in two volumes in 1861, and thus, after an entombment of nearly seventy years, were added "to the common intellectual property of mankind."

Prof. Owen's connection with the Royal College of Surgeons ceased in 1856, when he was appointed Superintendent of the Department of Natural History in the British Museum. He was the Lecturer on Palæontology at the School of Mines in Jermyn Street in 1856, and Fullerian Professor of Physiology in the Royal Institution of Great Britain in 1858.

When Prof. Owen entered on his duties at the British Museum his attention was at once called to the subject of the want of space wherein to stow the rapidly-increasing natural history collections. For several years already had Dr. Gray, to whom this Museum owes so much, urgently demanded additional space. In 1851, in 1854, and again in 1856, Dr. Gray implored for more room; scarcely half of the zoological collections was exhibited to the public, and their due display, he declared, would require more than twice the space devoted to them. Numerous suggestions were made to remedy this state of things, but without avail. Even such distinguished trustees as the late Sir Roderick Murchison and Sir Philip Grey Egerton, backed though they were by a large and most influential body of scientific memorialists, were powerless to obtain the least of the additions to the British Museum which they had recommended—additions which long ere this date would have been overcrowded in their turn. The Government declined to carry into effect any alterations in the present building in Great Russell Street, preferring the alternative of a severance of the Natural History Department from the British Museum. At this juncture it seemed to Prof. Owen to be unwise and indeed even wrong to hazard the safety and utility of these collections by persisting in the advocacy of a course which was futile, and having satisfied the then Chancellor of the Exchequer of the exigencies of the case, plans were obtained for a large new museum at South Kensington which would afford a superficial space for display of the collections, systematically arranged, of about five acres. Prof. Owen's report (1859) was approved of, but a vote on account of the new building was negatived by the House of Commons. This led to the publication of a pamphlet by Prof. Owen, "On the Extent and Aims of a National Museum of Natural History," in 1862, and as a final result the Government obtained the sanction of Parliament in 1872 to the erection at South Kensington of the magnificent range of buildings there just completed, in which in process of time the whole of the natural history treasures of the British Museum will be systematically arranged.

For long the propriety of moving this collection from Great Russell Street was hotly contested, and as in other great questions the weight of authority could at one time be quoted as against the move. Scientific men are however as a rule not often to be unduly swayed even by authority and they are generally philosophical enough to accept accomplished facts. In this immense building the State has provided ample accommodation, so far as space is concerned, for the present collections and for the probable increase of these for another generation; and not content with this, there is in addition room enough for future generations if they feel inclined, to nearly double the available space, and thereby even add to the beauty and completeness of the whole structure. In the obtaining of this splendid casket in which to display Nature's gems, Prof. Owen has seen accomplished one great object of

his life; and even those who think it might have been better for science had their own peculiar plans been carried into effect, will hardly grudge Prof. Owen the palm of victory which he may have won from them.

The necessary and often arduous routine work required of Prof. Owen as head of so large a department did not in any great measure diminish the extraordinary activity with which he from time to time published original works. Nearly a quarter of a century has elapsed since he entered on his duty at the British Museum, and the record of his contributions to science during this period equals, if it does not surpass, that of the previous thirty years period. Among the more important of these we must notice: Memoir on the British Fossil Reptiles of the Mesozoic Formations—Pterodactyles, 1873-1877; on the British Fossil Reptiles of the Liassic Formations—Icthyosaurs and Plesiosaurs, 1865-1870; on the British Fossil Cetacea of the Red Crag, 1870; on the Fossil Reptiles of South Africa, 1876; on the Classification and Geographical Distribution of Mammals, 1859; a Manual of Palæontology, 1861. The long list of papers published in the *Proceedings* of learned societies, to be found in the Royal Society's invaluable Catalogue (numbering over 360), includes many, the scientific value of most of which would have given an abiding fame to their author. It would be impossible here to give even a tithe of their titles, but we quote a few to show that Prof. Owen left few of the classes of the animal kingdom unnoticed:—On the Andaman Islanders; on the Anthropoid Apes; on the Aye-Aye; on the Giraffe; on the Great Anteater; on the Great Auk; on the Dodo; on the *Apteryx australis;* on *Lepidosiren annectens;* on the *Argonauta argo;* on *Spirula australis;* on Clavagella; on *Limulus polyphemus;* on Entozoa; on *Euplectella cucumer* and *E. aspergillum.*

In 1857 he was elected president of the British Association for the Advancement of Science. In 1859 he was chosen one of the eight Foreign Associates of the Institute of France (in succession to Robert Brown). The King of Italy conferred on him the "Ordre de St. Maurice and St. Lazare" in 1862. The Emperor of Brazil in 1873 gave him the Imperial Order of the Rose, while in the same year the Queen conferred on him the Order of the Bath. In 1874 the Academy of Medicine, Paris, elected him as one of their Foreign Associates in succession to Baron Liebig.

At an age when most men have to cease from their labours, the subject of this necessarily brief notice works on. No better proof could there be of a spirit still young, than to witness the energy with which he has entered on the occupation of the new home for natural history at South Kensington; and who will not join in the hope that he may live to see its treasures arranged in an orderly sequence. In this sketch we have presented Prof. Owen as one eminently qualified to take high rank among our Scientific Worthies. What niche in the temple of fame he may permanently occupy is perhaps better left to a generation removed from our own to determine. To us it would seem as if a double portion of the spirit of Cuvier had without doubt fallen upon Owen, who has raised for himself a monument of work that is truly stupendous.

INSECT VARIETY

Insect Variety: its Propagation and Distribution. Treating of the Odours, Dances, Colours, and Music in all Grasshoppers, Cicadæ, and Moths; Beetles, Leaf-Insects, Bees, and Butterflies; Bugs, Flies, and Ephemeræ; and Exhibiting the Bearing of the Science of Entomology on Geology. By A. H. Swinton, Member of the Entomological Society of London. (London, Paris, and New York: Cassell, Petter, Galpin and Co. No date.)

WHEN Mr. Darwin published his "Descent of Man" in 1871 non-entomological readers were first made acquainted with a host of interesting facts connected with the various sounds produced by insects, the different colours in the two sexes, with their corresponding senses, emotions, and habits, so far as these bore upon the question of sexual selection. As in so many other cases Mr. Darwin's volume was the means of attracting the attention of working entomologists to this interesting field of observation, which has since been assiduously worked by Dr. Fritz Müller in Brazil, while in this country Mr. Swinton has for many years devoted himself to its study, both by personal observation and by collecting together the scattered observations spread over the entire literature of entomology, the result of his labours being embodied in the present volume.

No more interesting or instructive subject could be found for a great entomological work. The author appears to have spared no pains in the collection and elaboration of his materials. The book is full of original observations, and carefully drawn tabular statements of facts. It is copiously illustrated with roughly executed but characteristic figures; and the writer is evidently a man of wide information and some literary skill. But notwithstanding all these points in its favour, the book—except as a mere collection of facts—is a disappointing one. The arrangement is frequently defective; the style is often so vague and high-flown as to be actually unintelligible; while whenever an attempt is made to generalise the facts adduced, the writer appears to have no definite views of his own, or if he has is quite unable to convey them to the reader. A few examples will serve to illustrate the several merits and defects here pointed out.

In discussing the combats of male insects as tending towards a selection of powerful males from which to continue the race, our author well remarks that the law of the prior appearance of the males subjects them also to all atmospheric and other influences, "rendering them inured to manifold terrestrial strife previous to propagating their kind." This is a good observation; but what is probably a more important function of the early appearance of the males is, that the females should not have to wait long in order to be impregnated and thus be exposed to the dangers of destruction, owing to their usually slower flight and consequent defencelessness, before their great duty of oviposition has been safely performed.

The remarkable discovery by Dr. Fritz Müller of scent-producing organs in a variety of Brazilian butterflies, is here supplemented by an account of the numerous cases in which analogous organs, often of very varied kinds, have been found in moths, though in comparatively few instances has any odour been actually detected. It may